

PCT

WORLD INTELLECTUAL PROPERTY
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER 1

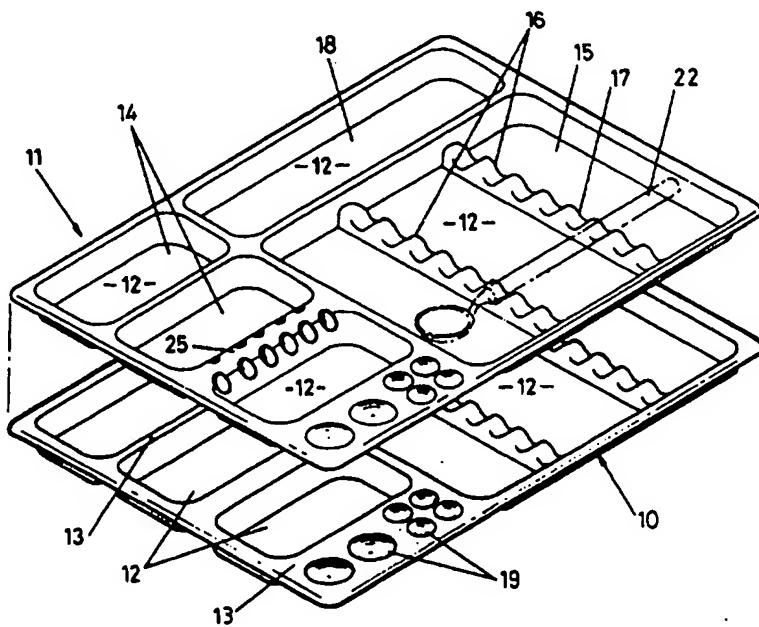
WO 9607364A1

WO 96/07364

(51) International Patent Classification ⁶ :	A1	(11) International Publication Number:	WO 96/07364
A61B 19/02, B65D 1/34, 1/36, 1/38, 25/16		(43) International Publication Date:	14 March 1996 (14.03.96)

(21) International Application Number:	PCT/NZ95/00082	(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ, UG).
(22) International Filing Date:	5 September 1995 (05.09.95)	
(30) Priority Data:	264393 5 September 1994 (05.09.94) NZ	
(71)(72) Applicant and Inventor:	DUNCAN, Stephen, Gilbert [NZ/NZ]; 11 Lynwood Avenue, Maori Hill, Dunedin (NZ).	Published
(74) Agents:	BENNETT, Michael, R. et al.; A J Park & Son, 6th floor, Huddart Parker Building, Post Office Square, P.O. Box 949, Wellington 6015 (NZ).	With international search report.

(54) Title: TRAY AND DISPOSABLE LINER THEREFOR



(57) Abstract

A tray (10) and a disposable liner (11) therefore are provided, particularly for use in dental procedures. The tray (10) has an upper surface with a plurality of recessed compartments (12) separated by raised portions (13). The liner has a substantially matching upper surface and a substantially complementary lower surface whereby the liner can nest on the tray. The tray provides structural support for the liner which allows the liner to be made lighter and at less expense than would otherwise be the case.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

TRAY AND DISPOSABLE LINER THEREFOR

TECHNICAL FIELD

This invention relates to a tray and disposable liner. The invention relates particularly
5 to the types of tray employed by dental professionals to hold the various instruments,
equipment and chemical compounds used during dental procedures.

BACKGROUND ART

Dental work requires a dental professional to have both hands free when treating a
10 patient. As a result, an apparatus is required to hold the variety of instruments such as mirrors,
picks and scrapers in addition to absorbent pads and the various chemical compounds which
are used during dental treatment. The apparatus preferably also provides a surface or surfaces
for mixing solutions. The apparatus is usually in the form of a tray which must be capable of
holding the various instruments and equipment in such a way that the dental professional can
15 readily select them for use as required.

To prevent cross-infection during dental procedures all items used in the mouth must
have been sterilised or be disposable and where possible this should include all surfaces
contacted by these items prior to or during their use. To clean and sterilise large items or
surfaces such as dental trays between each patient is not cost effective and is often impossible.

20 In an attempt to eliminate the time and expense spent sterilising and cleaning trays
between treatments, various disposable dental trays have been devised. However, as the
essential function of a dental tray is to provide support for dental instruments and equipment,
it must be constructed to be relatively rigid. Therefore, these so called disposable trays are
25 usually constructed of relatively thick material, which is usually a moulded plastics material, to
provide reinforcing and strength. Due to the relatively solid construction of these trays, they
are not particularly disposable in nature. They cannot always be easily destroyed or discarded,
and as they incorporate a substantial amount of plastics material they may be relatively
expensive, particularly as they are only intended for a single use. Also, because of their thick
construction they can create packing and storage problems for a dental professional who may
30 wish to purchase several hundred at one time.

An example of a prior art disposable dental tray is given by US Patent 4,852,738. That
tray has an upper surface having a plurality of recessed compartments separated by raised
portions and a lower surface which is substantially complementary to the upper surface. The
compartments are adapted to receive a plurality of dental instruments and accessories.

35 A similar type of disposable dental tray is disclosed in French Patent Publication
2,646,770. However, in this case the tray forms part of a pack which includes dental
instruments in the tray and a plastics film sealed over the tray to maintain sterility of the upper

surface of the tray and the instruments until the film is removed for use of the tray and instruments.

To avoid having to dispose of the tray after a single use, tray and liner combinations have been devised where it is the liner that is disposed of after a single use. The advantage of this 5 is that the liner may use less material in its manufacture and be less expensive than the tray. Prior art tray and liner combinations comprise a flat-bottomed tray having upstanding peripheral walls and a liner having an upper surface having a plurality of recessed compartments separated by raised portions and a lower surface which is substantially complementary to the upper surface. The liner fits within the tray; being supported by the bottom and the walls of 10 the tray. However, because the tray is flat-bottomed, the raised portions of the liner receive no direct support from the tray. That means that if the liner is not sufficiently strong, these raised portions of the liner can be deformed or crushed when the tray and liner are being used. The liner can be made thicker and stronger to reduce or prevent this problem but then the liner uses more material in its construction which adds to its cost and means greater waste of 15 material. The aforementioned French Patent Publication 2,646,770 also discloses this type of tray and liner combination. In addition, this type of tray and liner is available in the United States from Henry Schein, Inc.

DISCLOSURE OF INVENTION

20 It is an object of the present invention to provide a tray and disposable liner which will avoid the difficulties outlined above and/or which will at least provide the public with a useful choice. The present invention avoids the need for extensive cleaning and sterilisation between dental treatments by providing a dental tray with a thin disposable liner. The construction of 25 the preferred liner is such that it can easily be discarded and is also cheaper and therefore more disposable in nature than the tray.

In a first aspect, the present invention consists in a tray and a liner therefor, the tray having an upper surface having a plurality of recessed compartments separated by raised portions;

and the liner having an upper surface having a plurality of recessed compartments 30 separated by raised portions substantially corresponding to the compartments and raised portions of the tray, and a lower surface substantially complementary to the upper surfaces of the tray and the liner whereby the lower surface of the liner can be nested on the upper surface of the tray in a substantially complementary fit.

In a second aspect the present invention consists in a liner for use with a tray as defined 35 above with respect to the first aspect of the invention.

The tray is preferably substantially rigid to provide support for the liner and the liner is preferably semi-rigid to facilitate its nesting on the tray.

Both the tray and the liner are preferably made of a plastics material, an opaque, preferably white, plastics material such as polystyrene being preferred for the tray and a liquid-impervious, transparent plastics material such as polyethylene terephthalate (PET) being preferred for the liner.

5 The tray will usually be thicker than the liner, for example having a thickness of up to about 3 mm whereas the tray has a thickness of up to about 200 microns.

The complementary fit between the lower surface of the liner and the upper surface of the tray is preferably a substantially frictionless fit to facilitate easy nesting of the liner on the tray and easy removal of the liner from the tray.

10 The preferred liners are nestable together for stacking in packs of liners for sale or storage. The preferred trays are similarly nestable together for stacking in packs of trays and therefore have their bottom surfaces shaped substantially complementary to their upper surfaces.

15 The liner may be provided with a lid which may be a separate lid or an integrally hinged lid.

20 Preferably the recessed compartments of the upper surface of the liner, which substantially correspond to the recessed compartments of the upper surface of the tray, are shaped to be suitable for holding dental instruments and equipment and, optionally, for storing and mixing solid and liquid compounds used during dental procedures. The recessed compartments may comprise a plurality of substantially rectangular recessed compartments and/or a plurality of substantially semi-spherical recessed compartments. "Semi-spherical" includes but is not limited to hemispherical. Preferably there is at least one substantially rectangular recessed compartment and at least one substantially semi-spherical recessed compartment, and more preferably at least two of each.

25 Preferably there is at least one substantially rectangular compartment which has instrument supporting means for supporting elongated instruments in a position raised above the bottom of the compartment. The supporting means may comprise two spaced apart ridges, each having a series of indentations along its length whereby an elongated instrument can be placed across both ridges, in an indentation in each ridge, to be supported thereby.

30 The recessed compartments will usually occupy a substantial part of the upper surface of the tray and liner and the raised portions between the compartments generally comprise ridges. The preferred liner has means to support dental burs in a generally upright manner. This is preferably provided by at least one of the ridges between the recessed compartments of the liner having a plurality of recesses to support dental burs. These recesses may be staggered 35 on each side of the ridge to ease retrieval of dental burs when supported thereby.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention consists in the foregoing and also envisages constructions of which the following gives examples, wherein:

5 Figure 1 shows a perspective view of a preferred form of tray and disposable liner, the liner being shown raised clear of the tray;

Figure 2 shows a top plan view of the liner;

Figure 3 shows a cross-section of the liner (being a cross-section on III-III of Figure 2) nested upon the tray which is also shown in cross-section;

10 Figure 4 shows a detailed cross-section of the liner (being a cross-section on A-A of Figure 2);

Figure 5 shows a perspective view of another preferred form of tray and disposable liner, the liner being shown slightly raised above the tray; and

Figure 6 shows a perspective view of a tray and liner similar to that shown in Figure 5 except that the liner has a lid hinged at one side thereof.

15

MODES FOR CARRYING OUT THE INVENTION

Some preferred forms of the tray and disposable liner will now be described with reference to the embodiments shown in the drawings. Figure 1 shows an exploded perspective view of a dental tray 10 with a disposable liner 11. As illustrated, the liner 11 is designed to fit directly on top of the tray 10 and in this way is used to support dental equipment and materials during dental procedures. The liner 11 can then be replaced after each treatment. A typical tray and liner may each have a length of about 323 mm and a width of about 235 mm.

The tray 10 has an upper surface having a plurality of recessed compartments 12 separated by raised portions 13. The tray 10 should be constructed to be substantially rigid and 25 a moulded, substantially rigid plastics material is most suitable. In a preferred form, the tray 10 is made of an opaque plastics material which, when the liner is made of transparent material, as is preferred, provides a contrasting background for instruments 22 such as the one shown when placed on the liner-fitted tray, enabling a user to readily select instruments as required. As the tray 10 must provide support for the liner 11 and ultimately for the instruments 22 and 30 equipment which are being used, it must be constructed of a plastics material of a nature and thickness which provides the necessary rigidity. The tray is preferably constructed of polystyrene and is preferably up to about 3 mm in thickness, being most preferably in the range from about 2 mm to about 3 mm. This relatively rigid construction enables the tray 10 to be reused many times before it needs to be replaced.

35 The liner 11 also has an upper surface having a plurality of recessed compartments 12 separated by raised portions 13. These substantially correspond with the compartments and raised portions of the upper surface of the tray. In the drawings like parts of the tray and the

liner are generally given like numbering. The shape of the lower surface of the liner is substantially complementary to that of the upper surface of the liner 11 and therefore that lower surface is also substantially complementary to the upper surface of the tray 10. This enables the liner to nest on the tray, the recessed compartments of the liner fitting within the 5 substantially corresponding recessed compartments of the tray as shown in Figure 3. To facilitate this nesting, the walls 30 of the recessed compartments of the liner and of the tray are angled inwardly, for example by 10-15°, towards the bottoms 31 of the compartments. This feature is also shown in Figure 3. An advantage of this feature is that it allows a plurality of liners to be nested together for packing, whether in lots for sale or for storage. If the walls of 10 the compartments should be substantially vertical then the compartments of the liner need to be made a little smaller than those of the tray in order to fit within them and allow the liner to nest on the tray. A disadvantage of that particular arrangement is that a plurality of liners by themselves cannot be nested together.

As the tray 10 provides its structural framework and support, the liner 11 can be 15 constructed of a very lightweight, disposable material. The function of the liner 11 is to hold dental instruments 22 and equipment and preferably chemical compounds too and therefore it should be constructed of an impervious material to prevent leakage through to the tray when nested on the tray 10. It is preferable that although the liner is constructed of a thin material, it is semi-rigid in nature to better facilitate nesting on the tray. For the liner 11 to possess the 20 necessary properties, it is ideally constructed of a plastics material, this preferably being a transparent plastics material and preferably also being a recyclable material. A preferred plastics material is polyethylene terephthalate (PET) and the preferred liner has a thickness of up to about 200 microns, most preferably a thickness in the range from about 100 microns to about 200 microns. The liner 11 provides a protective plastics "film" over the reusable tray 25 during dental treatment and due to its thin, lightweight construction it can be easily crushed or broken up when removed from the tray and it is therefore easily disposed of after use. As each liner 11 is only made of a small amount of material, wastage of plastics resources is kept to a minimum. The preferred construction of the liners 11 also enables them to be packaged and stored in large quantities, saving space and making for ease of handling. Lightweight, low 30 volume construction also reduces the cost of each liner 11.

As already explained, both the tray 10 and liner 11 have substantially corresponding recessed compartments 12 in their upper surfaces. These compartments 12 enable the liner 11 to be firmly nested on top of the tray 10 when in use. Raised portions 13, which make up the rest of the upper surface of both the tray 10 and liner 11 keep the liner 11 firmly in place and prevent it from sliding in relation to the tray 10. The recessed compartments 12 are shaped to 35 be suitable for the intended use of the tray 10 and liner 11. While the preferred use is for supporting dental equipment, the compartments 12 could be adapted to hold surgical

instruments, equipment used in general medical treatments or equipment used in veterinary treatment, food preparation or simple laboratory experiments. Basically, the shape and configuration of the compartments 12 could be adapted for specific use of equipment for any procedure where cross-infection or cross-contamination is to be prevented.

5 In the preferred embodiment which is a dental tray 10 and liner 11, the recessed compartments 12 are shaped to be suitable for holding dental instruments 22 and other equipment. The recessed compartments 12 can comprise several substantially rectangular compartments 14 which can receive dental instruments 22 and other equipment, for example absorbent materials such as cotton wool which are used during dental procedures. At least one
10 of the rectangular compartments 15 preferably includes as part of the upper surface of the tray and liner, a means for supporting elongated dental instruments 22. This can be in the form of two raised parallel ridges 16 which divide the compartment. Each of these raised ridges 16 can have a series of indentations 17 along its length to hold dental instruments 22 above the bottom 31 of the compartment 15. This enables a dental professional to easily select and pick up
15 instruments, for example, elongated instruments such as mirrors, picks and scrapers from the tray 10 and liner 11 and then replace them after use during dental treatment. Other rectangular shaped recessed compartments of various sizes 18 can be provided for other dental equipment and materials used during treatments.

The upper surface of the tray 10 and liner 11 can also have several semi-spherical
20 compartments 19 in which solid and liquid dental compounds can be placed during dental treatment. A dental professional may place materials such as filling compounds and cleaning solutions in these compartments 19, which would enable them to be easily mixed and administered during treatment.

Figure 2 shows a top plan view of the configuration of the recessed compartments 12 of
25 the upper surface of the liner 11 which substantially corresponds to the upper surface configuration of the tray 10. The figure indicates that in this preferred embodiment the recessed compartments 12 occupy most of the upper surface of the tray 10 and liner 11 and that the raised portions between the compartments comprise ridges 20 and 25. Preferably, as shown in Figure 4, at least one of the ridges 25 of the liner includes several small recesses 23 to locate
30 and support dental burs 24 in a generally upright manner. As shown in Figure 2, these recesses 23 can be staggered on either side of the ridge 25, to ease retrieval of the burs 24 by a dental professional when required during treatment. Alternatively the recesses for dental burs could be in the form of holes or cavities in a substantially flat portion in the upper surface of the liner.

To enable a dental professional to replace each liner 11 with a new clean liner after each
35 treatment, the tray 10 and liner 11 are of a complementary fit as illustrated in Figure 3. This figure shows the liner 11 placed on top of the tray 10 as it would be when in use for holding dental instruments and equipment. While a firm, complementary fit is preferably provided so

that the liner 11 does not move in relation to the tray, the liner 11 preferably does not grip the tray 10 and so is easily fitted on the tray and then is easily lifted off after use. The disposable liner 11 can then be discarded along with any dental compounds or waste left over after the treatment.

- 5 Although the tray 10 is constructed so as to be reusable, it will eventually deteriorate and need to be disposed of. Therefore, to minimise waste and reduce cost, the bottom surface 21 of the tray 10 can be substantially complementary to its upper surface as shown in Figure 3, instead of having a flat base. This feature allows the preferred trays to be nested together, for example, for packing in lots for sale or for storage.
- 10 Another embodiment of dental tray 10 and liner 11 is shown in Figure 5. This is a smaller tray and liner, for example, having a length of about 250 mm and a width of about 120 mm. The tray and liner are provided with two substantially semi-spherical recessed compartments 19 and two substantially rectangular recessed compartments, 12 and 15, the compartment 15 being much larger than the compartment 12. The compartment 15 has two
15 spaced parallel ridges 16, each having a series of indentations 17 along its length whereby elongated dental instruments can be supported above the bottom of the compartment. It is possible for a tray and liner to have only substantially rectangular recesses or only substantially semi-spherical recesses but it is preferred that there be at least one substantially rectangular recess and at least one substantially semi-spherical recess, and more preferably at least two of
20 each. The tray and the liner may have recessed compartments of other shapes.

- Figure 6 shows a modified tray and liner 11 of the type shown in Figure 5, the modification comprising a lid 26 for the liner. The lid may be made separate from the liner but it is preferred that it be made integral with the liner, being joined at 27 by a plastic hinge along an edge of each of the lid and the liner. The lid may have a peripheral flange 28 which frictionally grips a corresponding peripheral flange 29 of the liner when the lid is closed in order to hold the lid closed. Alternatively the flanges 28 and 29 may have one or more matching and inter-engaging projections and recesses to achieve this.

- The walls 30 or ridges 20 between adjacent compartments need not, or need not all, extend the full height of the tray and liner. It is possible for one or more of them to extend up
30 only part way. In this case the shortened wall or ridge may optionally be utilised as a means for supporting a dental instrument above the bottoms 31 of the adjacent compartments. Alternatively, the shortened wall or ridge may make access to adjacent compartments easier. For example, the tray and liner of Figure 1 may each have a height of about 25 mm and the shortened wall may extend up only about 3-5 mm. Again with reference to Figure 1 and by
35 way of example, the walls between the corner one of the compartments 14 and the adjacent compartment 18 and optionally between that compartment 18 and the adjacent compartment

15 may be shorter walls where the raised portions between those respective pairings of compartments do not extend the full height of the tray and of the liner.

Both the tray and the liner can be cut or stamped from sheets of plastics material in which the shapes of the tray and the liner are moulded, for example, by a vacuum moulding operation.

5 While the disposable liner is preferably constructed of a plastics material, other disposable materials could be used. Alternatives include treated paper or card which would be liquid impervious and therefore function as suitable dental tray liners.

The tray can also be constructed of other plastics materials, such as polyethylene, or of a non-plastics material. The tray may be constructed of any material which is capable of 10 providing support for the disposable liner and the equipment to be held on it. Possible materials include metal and wood.

While it is considered that the invention is particularly useful for dental treatment, it is not confined to this use. The present invention has application to any procedure whereby implements and equipment are used and there is a need to avoid cross-infection. Other possible 15 uses include surgical procedures, general medical treatment, veterinary treatment, food preparation and even general laboratory procedures whereby cross-contamination rather than cross-infection is the problem to be avoided.

CLAIMS:

1. A tray and a disposable liner therefor, the tray having an upper surface having a plurality of recessed compartments separated by raised portions; and the liner having an upper surface having a plurality of recessed compartments separated by raised portions substantially corresponding to the compartments and raised portions of the tray, and a lower surface substantially complementary to the upper surfaces of the tray and the liner whereby the lower surface of the liner can be nested on the upper surface of the tray in a substantially complementary fit.

2. A tray and a liner according to claim 1 wherein the tray is substantially rigid to provide support for the liner when the liner is nested on the tray.

3. A tray and a liner according to claim 1 or 2 wherein the liner is semi-rigid to facilitate its nesting on the tray.

4. A tray and a liner according to any one of the preceding claims wherein the complementary fit between the lower surface of the liner and the upper surface of the tray is a substantially frictionless fit to facilitate easy nesting of the liner on the tray and easy removal of the liner from the tray.

5. A tray and a liner according to any one of the preceding claims wherein the tray has a lower surface which is substantially complementary to the upper surface of the tray.

6. A tray and a liner according to any one of the preceding claims wherein the tray has a thickness greater than that of the liner.

7. A tray and a liner according to claim 6 wherein the tray has a thickness of up to about 3 mm.

8. A tray and a liner according to claim 7 wherein the tray has a thickness in the range from about 2 mm to about 3 mm.

9. A tray and a liner according to any one of the preceding claims wherein the liner has a thickness of up to about 200 microns.

10. A tray and a liner according to claim 9 wherein the liner has a thickness from about 100 microns to about 200 microns.

11. A tray and a liner according to any one of the preceding claims wherein the tray 5 is made of an opaque material.

12. A tray and a liner according to any one of the preceding claims wherein the tray is made of a plastics material.

10 13. A tray and a liner according to claim 12 wherein the tray is made of polystyrene.

14. A tray and a liner according to any one of the preceding claims wherein the liner is impervious to liquids.

15 15. A tray and a liner according to any one of the preceding claims wherein the liner is made of a transparent material.

16. A tray and a liner according to any one of the preceding claims wherein the liner is made of a plastics material.

20 17. A tray and a liner according to claim 16 wherein the liner is made from polyethylene terephthalate.

25 18. A tray and a liner according to any one of the preceding claims wherein the plurality of recessed compartments in each of the tray and the liner comprises a plurality of substantially semi-spherical recessed compartments.

30 19. A tray and a liner according to any one of the preceding claims wherein the plurality of recessed compartments in each of the tray and the liner comprises a plurality of substantially rectangular recessed compartments.

35 20. A tray and a liner according to any one of claims 1-17 wherein the plurality of recessed compartments in each of the tray and the liner comprises at least one substantially rectangular recessed compartment and at least one substantially semi-spherical recessed compartment.

21. A tray and a liner according to claim 19 or 20 wherein at least one substantially rectangular compartment in each of the tray and the liner has instrument supporting means for supporting elongated instruments in a position raised above a floor of the compartment.

5 22. A tray and a liner according to claim 21 wherein the supporting means comprises two spaced apart ridges raised from the floor, each ridge having a series of indentations along its length whereby an elongated instrument can be placed across both ridges, in an indentation in each ridge, to be supported thereby.

10 23. A tray and a liner according to any one of the preceding claims wherein the recessed compartments of the upper surface in the liner which substantially correspond to the recessed compartments of the upper surface of the tray, are shaped to be suitable for holding dental instruments and equipment and, optionally, for storing and mixing solid and liquid compounds used during dental procedures.

15

24. A tray and a liner according to claim 23 wherein the liner has means to support dental burs in a generally upright manner.

20 25. A tray and a liner according to claim 24 wherein at least one raised portion between adjacent recessed compartments has a plurality of recesses providing said means to support dental burs.

25 26. A tray and a liner according to claim 25 wherein the recesses are staggered on opposite sides of the at least one raised portion to ease retrieval of dental burs when supported thereby.

30 27. A tray and a liner according to any one of the preceding claims wherein at least one raised portion between adjacent compartments does not extend the full height of the tray nor of the liner.

30

28. A tray and a liner according to any one of the preceding claims wherein the liner is provided with a lid.

35

29. A tray and a liner according to claim 28 wherein the lid is hinged to the liner.

30. A disposable liner for use in a tray and liner combination according to any one of the preceding claims.

31. A disposable liner for use with a tray having an upper surface having a plurality of recessed compartments separated by raised portions, the liner having an upper surface having a plurality of recessed compartments separated by raised portions substantially corresponding to the compartments and raised portions of the tray, and a lower surface substantially complementary to the upper surfaces of the tray and the liner whereby the lower surface of the liner can be nested on the upper surface of the tray in a substantially complementary fit.
- 5
32. A liner according to claim 31 wherein the liner is semi-rigid to facilitate its nesting on the tray.
- 10
33. A liner according to claim 31 or 32 wherein the liner has a thickness of up to about 200 microns.
- 15
34. A liner according to claim 33 wherein the liner has a thickness in the range from about 100 microns to about 200 microns.
35. A liner according to any one of claims 31-33 wherein the liner is impervious to liquids.
- 20
36. A liner according to any one of claims 31-35 wherein the liner is made of a transparent material.
37. A liner according to any one of claims 31-36 wherein the liner is made of a plastics material.
- 25
38. A liner according to claim 37 wherein the liner is made from polyethylene terephthalate.
39. A liner according to any one of claims 31-38 wherein the plurality of recessed compartments comprises a plurality of substantially semi-spherical recessed compartments.
- 30
40. A liner according to any one of claims 31-38 wherein the plurality of recessed compartments comprises a plurality of substantially rectangular recessed compartments.
- 35
41. A liner according to any one of claims 31-38 wherein the plurality of recessed compartments comprises at least one substantially rectangular recessed compartment and at least one substantially semi-spherical recessed compartment.

42. A liner according to claim 40 or 41 wherein at least one substantially rectangular compartment has instrument supporting means for supporting elongated instruments in a position raised above a floor of the compartment.

5 43. A liner according to claim 42 wherein the supporting means comprises two spaced apart ridges raised from the floor, each ridge having a series of indentations along its length whereby an elongated instrument can be placed across both ridges, in an indentation in each ridge, to be supported thereby.

10 44. A liner according to any one of claims 31-43 wherein the recessed compartments of the upper surface in the liner which substantially correspond to the recessed compartments of the upper surface of the tray, are shaped to be suitable for holding dental instruments and equipment and, optionally, for storing and mixing solid and liquid compounds used during dental procedures.

15 45. A liner according to claim 44 wherein the liner has means to support dental burs in a generally upright manner.

20 46. A liner according to claim 45 wherein at least one raised portion between adjacent recessed compartments has a plurality of recesses providing said means to support dental burs.

47. A liner according to claim 46 wherein the recesses are staggered on opposite sides of the at least one raised portion to ease retrieval of dental burs when supported thereby.

25 48. A liner according to any one of claims 31-47 wherein at least one raised portion between adjacent compartments does not extend the full height of the liner.

49. A liner according to any one of claims 31-48 wherein the liner is provided with a lid.

30 50. A liner according to claim 49 wherein the lid is hinged to the liner.

51. A disposable liner for a tray, the liner having an upper surface having a plurality of recessed compartments separated by raised portions and a lower surface substantially complementary to the upper surface whereby the lower surface of the liner can be nested on an upper surface of a tray which upper surface of the tray has a plurality of recessed compartments separated by raised portions substantially corresponding to the compartments

and raised portions of the upper surface of the liner, said liner being made of a semi-rigid plastics material which is impervious to liquids and which has a thickness of up to about 200 microns.

5 52. A liner according to claim 51 wherein the thickness of the liner is from about 100 microns to about 200 microns.

53. A liner according to claim 51 or 52 wherein the liner has a lid hinged thereto.

10 54. A tray and a disposable liner substantially as herein described with reference to any embodiment shown in the accompanying drawings.

55. A disposable liner substantially as herein described with reference to any embodiment shown in the accompanying drawings.

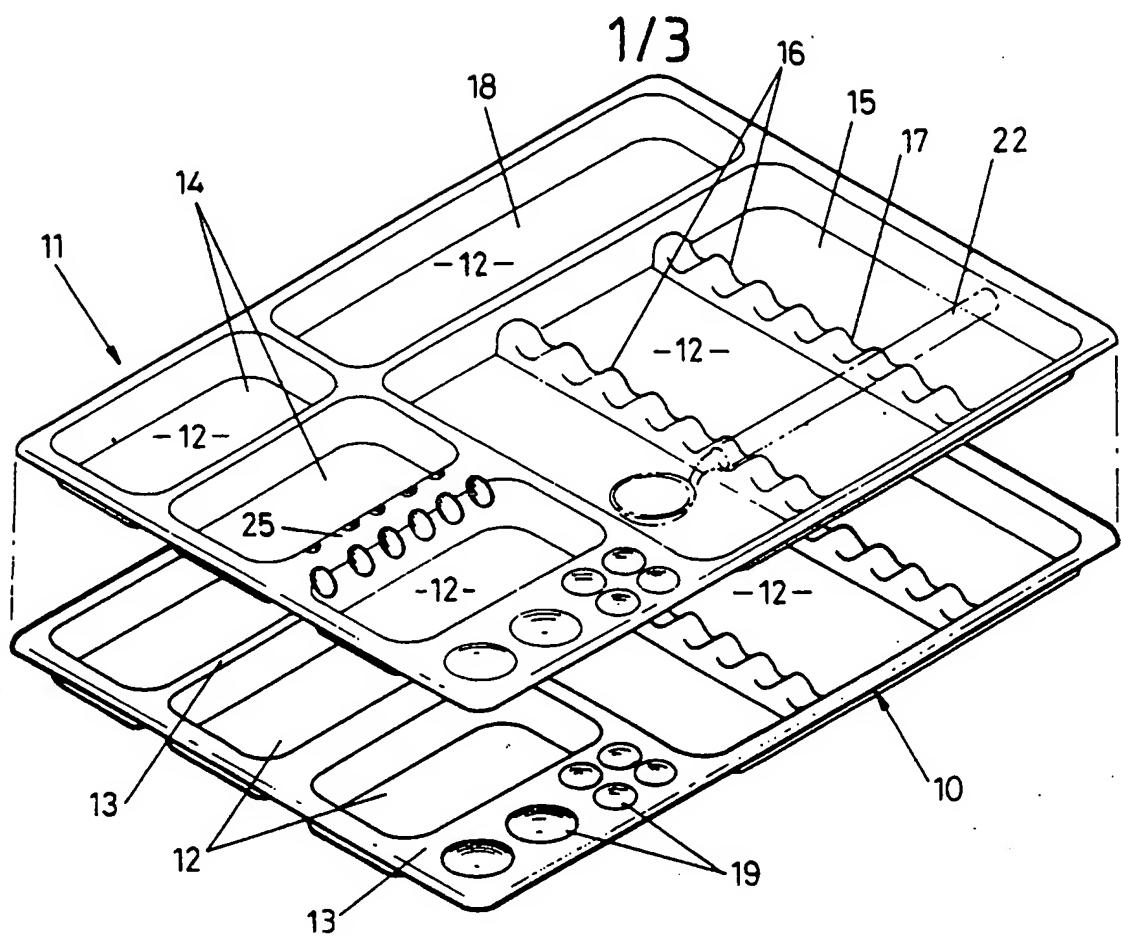
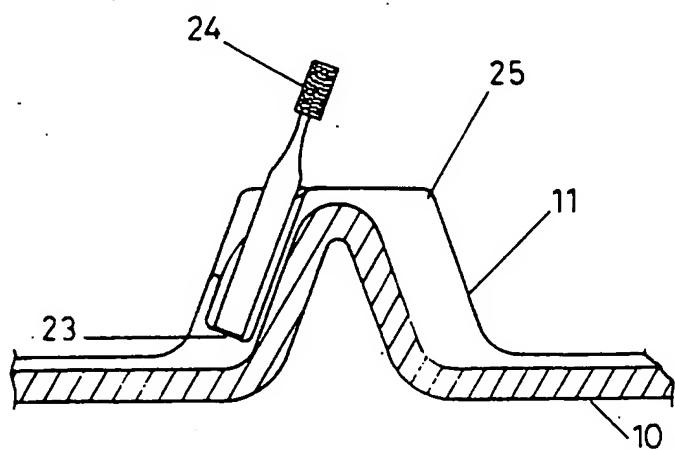
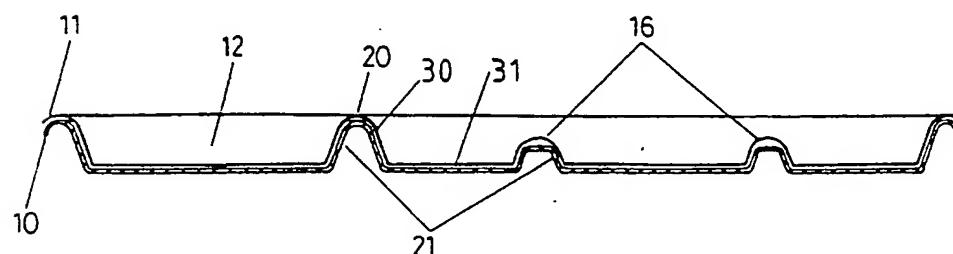
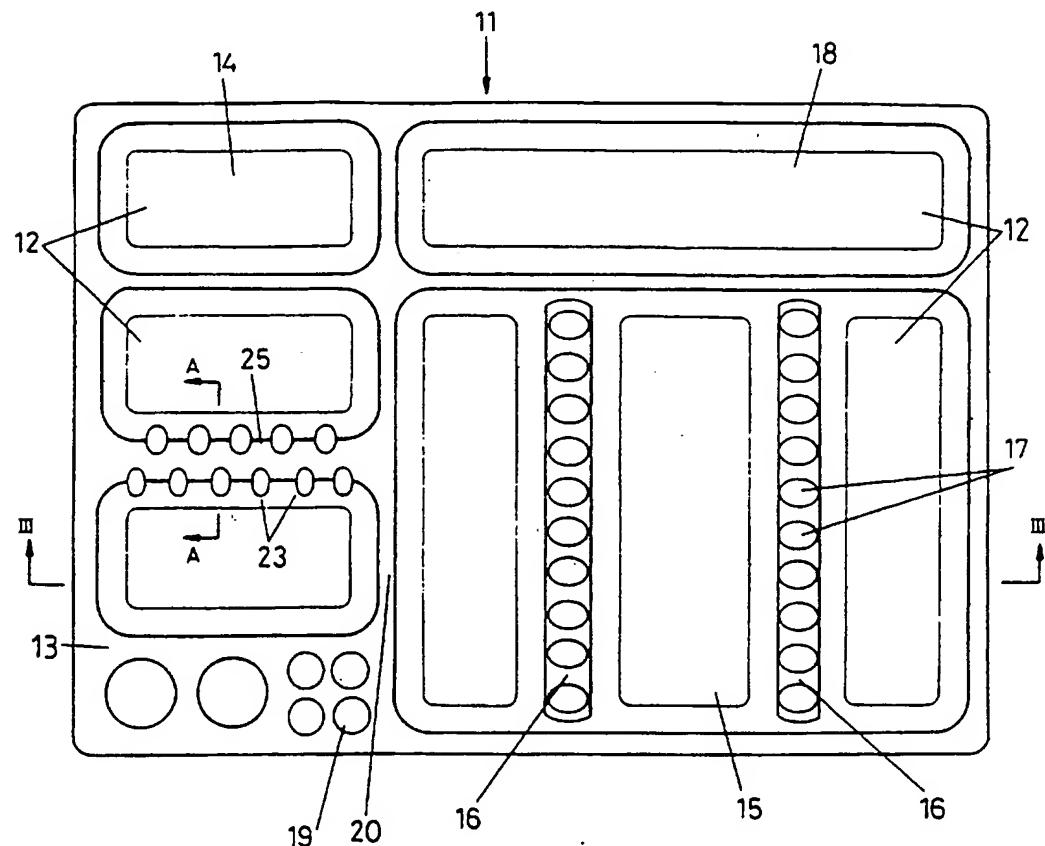


FIG 1

FIG 4



2/3



3/3

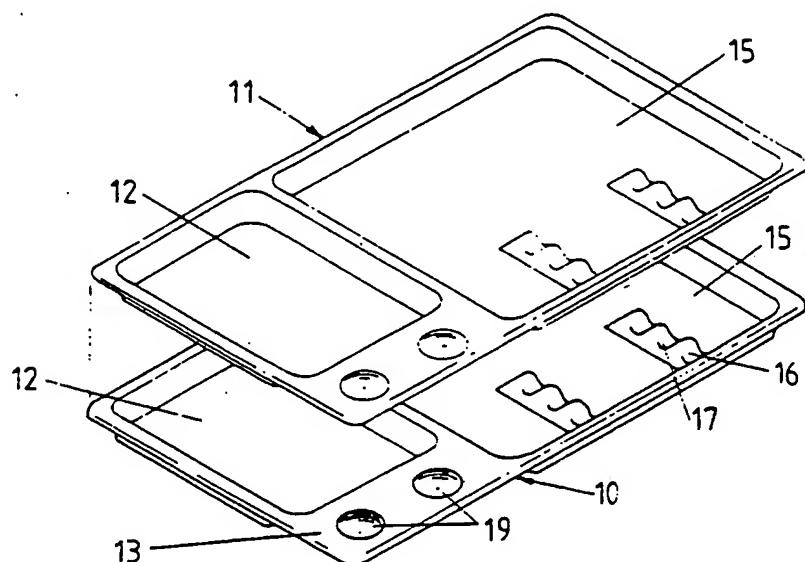


FIG. 5

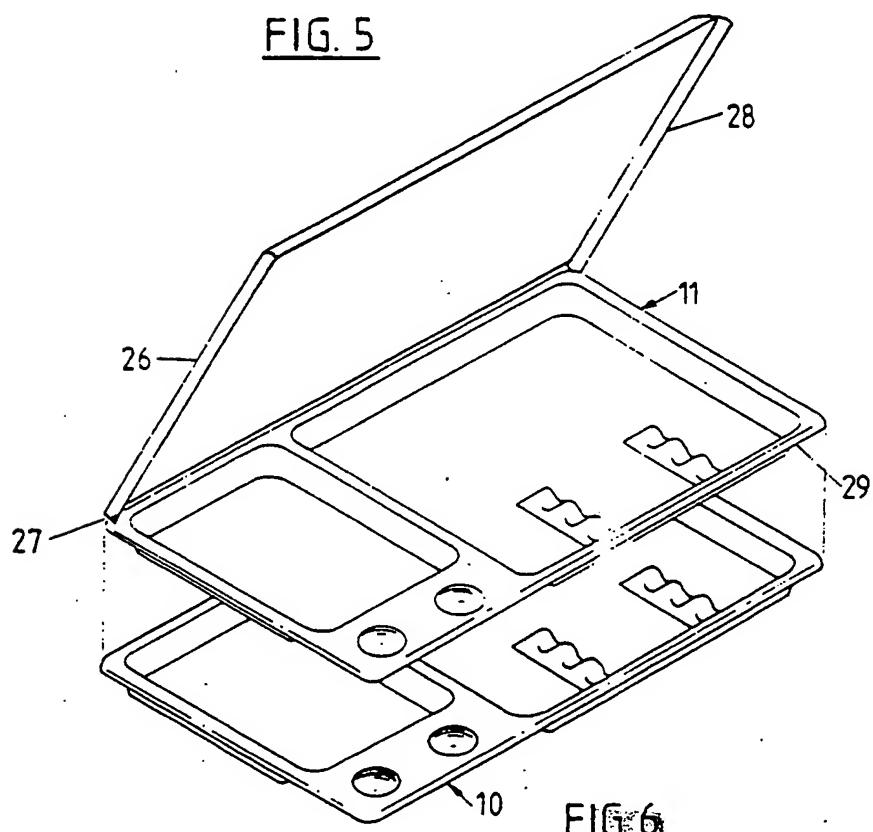


FIG. 6

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/NZ 95/00082

A. CLASSIFICATION OF SUBJECT MATTERInt Cl⁶: A61B 19/02; B65D 1/34, 1/36, 1/38, 25/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A61B 19/02; B65D 1/34, 1/36, 1/38, 25/16

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

AU: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

IPC: A61B 19/00; B65D 1/00, 25/00

DERWENT: tray liner correspond fit complement match

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US.A, 4078662 (VOLLAND) 14 March 1978 Columns 1 and 2	1-2, 5, 18, 30, 39, 51, 54-55
X	US.A, 3697223 (KOVALCIK et al.) 10 October 1972 Columns 2 to 4 and claim 8	1, 3-6, 11-12, 14, 16, 19, 23, 28, 30-31, 36- 37, 40, 44, 49, 54-55
X	GB.A, 1560488 (BOWATER PACKAGING LTD) 6 February 1980	1-2, 4-5, 11, 14, 18-20, 27-28, 30-32, 35, 39- 41, 48-49, 54-55

 Further documents are listed in the continuation of Box C See patent family annex

• Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document but published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

14 December 1995

Date of mailing of the international search report

19 December 1995

Name and mailing address of the ISA/AU
AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION
PO BOX 200
WODEN ACT 2606
AUSTRALIA Facsimile No.: (06) 283 3929

Authorized officer

S THOMAS

Telephone No.: (06) 283 2454

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/NZ 95/00082

C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP,A2, 308900 (NIPPON PETROCHEMICALS CO LTD) 29 March 1989	1-2, 5-6, 8-10, 12, 14, 16, 19, 21, 27-31, 33, 34-35, 37-42, 48, 51, 54-55

THIS PAGE BLANK (USPTO)